

EDIC/ID-35
Control No. 156501
14 April 1958

MEMORANDUM FOR: Economic Defense Intelligence Committee

FROM : Chairman, EDIC

SUBJECT : Sino-Soviet Bloc Supply of and Requirements
for Phthalic Anhydride

REFERENCE : EDIC Case No. 27, SECRET

The attached intelligence summary has been prepared by CIA in response to the referenced EDIC Case No. 27 initiated by the Department of Commerce. It is now distributed for review and acceptance by EDIC members.

If no request for consideration of this summary in an EDIC meeting is received prior to 00B 25 April 1958, it will be considered approved and EDIC Case No. 27 will be regarded as closed.

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Chairman

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Attachment:
Sino-Soviet Bloc Supply of and
Requirements for Phthalic Anhydride

Distribution:

Cat. B - (3-5, 8, 10)
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EDIC Case No. 27
Control No. 186501
14 April 1958

SUBJECT

Sino-Soviet Bloc Supply of and Requirements for Phthalic Anhydride.

REQUESTING AGENCY AND DATE

Department of Commerce, 25 March 1958.

DEADLINE FOR RECEIPT OF INFORMATION

As soon as possible.

PROPOSED USE

To complement the review currently undertaken by a Department of Commerce Technical Task Group in order to determine whether phthalic anhydride is of sufficient military-industrial significance to warrant its addition to the U.S. Positive List and possibly a recommendation for its inclusion in the International Lists.

REFERENCE

Memorandum to Chairman of EDIC from Department of Commerce representative, 25 March 1958.

BACKGROUND

The Bloc is a net importer of phthalic anhydride and phthalate esters. The USSR has recently expressed interest in importing substantial quantities of phthalic anhydride. At least part of the Bloc interest in imports of phthalic anhydride is believed due to expansion of facilities producing plastics, dyes and rubber. Inadequate equipment and technology appear to be responsible for the current Bloc shortage of phthalic anhydride rather than a shortage of the basic raw material, naphthalene. Most of the Bloc countries have plans to increase production of phthalic anhydride by 1960.

Phthalic anhydride is obtained by the oxidation of naphthalene* with the use of a vanadium pentoxide catalyst and condensation of the resultant product. Two thousand five hundred pounds of naphthalene are required to produce 2,000 pounds of phthalic anhydride.

* The U.S. also produces phthalic anhydride from ortho-xylene.

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- 2 -

Phthalic anhydride became an important item during World War II as a plasticizer for smokeless powder and as a base for insect repellants. A principal use for phthalic anhydride is in the production of phthalate esters employed as plasticizers or softeners for rubber and plastics. Alkyd resins, made from phthalic anhydride, are used for outdoor paints and are of significance in the surface coating of naval vessels. Anthraquinone vat dyes for military uniforms use phthalic anhydride as a base.

PRODUCTION

Naphthalene, the raw material for phthalic anhydride, is produced in several Bloc countries. Estimated Bloc production of naphthalene in 1957 is as follows:

<u>Country</u>	<u>Metric Tons</u>
China	10,000
Czechoslovakia	20,500
East Germany	5,600
Hungary	950
Poland	31,100
Rumania	800
USSR	120,000

Although the above quantities of naphthalene could support a substantial increase in the production of phthalic anhydride, the further processing of naphthalene into phthalic anhydride has until now been limited by deficiencies in both technical skills and plant equipment. Only 7 plants have been identified as producers of phthalic anhydride in the Bloc. Production of phthalic anhydride in the Bloc in 1957 is estimated as follows:

<u>Country</u>	<u>Quantity in Metric Tons</u>
Czechoslovakia	1,800
East Germany	9,600
Hungary	800
Poland	2,400
Rumania	200
USSR	10,000 - 12,000
Total	24,800 - 26,800*

The USSR announced in July 1957 that new technology and equipment for the oxidation of naphthalene to phthalic anhydride have been developed. An experimental workshop using the new process is scheduled to be built at a coke-chemical plant in Gorlovka, with subsequent construction of 2 additional workshops at other coke-

* By comparison, U.S. production of phthalic anhydride in 1956 was 25,000 tons.

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NOFORN

- 3 -

chemical plants. The combined capacity of the latter two shops is planned to be 27,000 metric tons.

TRADE

Available data from the U.S. Department of Commerce on shipments of phthalic anhydride from Western countries to the Bloc are included in Table I. These data, together with reports for previous years, clearly indicate a rising trend in Bloc imports of phthalic anhydride and phthalates from the West. The USSR appears to be the largest importer and in 1957 probably imported at least 5 thousand tons. If information were available on shipments from other Western countries such as Belgium, the Netherlands, Sweden and the UK, a more complete picture of Bloc imports would be obtained; while shipments of phthalic anhydride and phthalates from Bloc countries (chiefly East Germany) to the West have been observed in recent years, the Bloc undoubtedly has been a net importer of these chemicals.

Some intra-Bloc shipments have been observed. The indications are that these have originated largely in East Germany and have been destined mainly for the USSR, although the USSR, Czechoslovakia, Poland, and Hungary may export small quantities of phthalic anhydride and phthalates to other Bloc countries. According to one report, East German shipments of phthalic anhydride to the USSR were projected at an annual rate of 5 to 6 thousand tons for the 1957-60 period.

CONSUMPTION AND USES

Data are inadequate to establish a precise consumption pattern for phthalic anhydride in the Bloc, although available information on the USSR and East Germany indicate that the largest portion goes into plastics, paints, and plasticizers. Increases in requirements for conventional uses can be expected because of the current emphasis on increasing production of synthetics. No data are available on requirements of phthalic anhydride in the production of strategic items.

Domestic consumption of phthalic anhydride in East Germany in 1957 is estimated at about 4,600 tons, with the remaining 5,000 tons exported. Of the domestic consumption about 2,400 to 2,500 tons were used in the production of plasticizers* (dibutyl phthalate and dioctyl phthalate). About 1,600 tons of plasticizers were exported.

The total supply of phthalic anhydride available to the USSR in 1957 is tentatively estimated to be 20,000 to 22,000 tons. In view of the over-all Bloc shortage, it is likely that supply and consumption in the USSR are about the same. According to a USSR report, almost

* One ton of phthalic anhydride yields about 2 tons of plasticizers.

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- 4 -

90 percent of the phthalic anhydride is required for lacquers, paints, and plastics. It is also required for the production of insecticides, accelerators for the vulcanization of rubber, for the production of benzoic acid and for use in additives for lubricating oils. The Soviets admit that requirements exceed supply and plan to put new capacities into operation shortly, although their construction planning has been plagued by delays. Heavy emphasis was placed on increasing the production of synthetics in the original Sixth Five Year Plan, and this has since been reiterated with even greater emphasis in the planning for 1959-65, so that an increasing consumption of phthalic anhydride can be predicted.

Much of the phthalic anhydride consumed in Czechoslovakia is used in the production of dyestuffs, with most of the balance going into phthalate ester plasticizers. Requirements are growing steadily and in 1957 exceeded production by about 35 percent.

In Hungary and Rumania phthalic anhydride is also used largely for dyestuffs and plasticizers. Requirements in Hungary approximate output. In Rumania requirements are growing at a faster rate and are expected to use up any increases in production.

Poland utilizes its phthalates in the production of plastics, varnishes, dyes, and rubber products. The consumption picture for phthalic anhydride is somewhat confused because of evidence that it is both exported and imported, but Poland is clearly a net importer of the phthalate esters. By 1960, production of phthalates in Poland is expected to rise to 7,000 tons, enabling her to meet requirements from domestic sources.

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Table I
Soviet Bloc Imports of Phthalic Anhydride from Selected Western Countries, 1956-57

Destination	Metric Tons							
	West Germany		France		Italy		Japan	
	1956	1st Half 1957	1956	1st Half 1957	1956	1st Half 1957	1956	1st Half 1957
Soviet Bloc, total	826 <u>1/</u>	1093 <u>1/</u>	774	266	1699	3031	N.A.	95
Bulgaria	17	24						
Czechoslovakia	72	53						
Hungary	70	82	18					
Poland	621	589						
Rumania	4	45						
USSR		300	734	266 <u>2/</u>	1699 <u>3/</u>	3031		
Communist China	42		22					95

1. Includes phthalic acid, its salts, esters, and halogenated, nitrated and sulfonated derivatives. Reported shipment to the Bloc totaled 144 tons in 1955.
2. The Franco-Soviet trade agreement for 1957 provides for shipment of 2,000 tons.
3. Italy also shipped 304 tons of esters of phthalic acids.

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